

## **Space-Time and Space-Frequency Hopping for Capacity Enhancement of Mobile Data Systems**

### **ABSTRACT OF THE DISCLOSURE**

The present invention utilizes adaptive antenna arrays at a base station to increase the forward link capacity of mobile data systems. One or more simultaneous forward link beams are formed and are switched (or hopped) in a time division manner among subscribers. The beam hopping sequence is randomized by varying the time slot and/or carrier frequency of each subscriber. In space-time hopping, the position within a frame of the time slot for each subscriber is varied in a pseudo random sequence. In space-frequency hopping, the carrier frequency for each frame is varied in a pseudo random sequence. The pseudo random beam hopping sequence provides a gain due to interference diversity in addition to the antenna array gain. Forward link beam forming algorithms use space-time or space-frequency hopping to increase the capacity of mobile data systems.

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